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Implementation of Online Reporting form for Needle Stick Injury in the Accident and Emergency Department.

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Implementation of Online Reporting form

for Needle Stick Injury

in the Accident and Emergency Department

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Student declaration

“I certify that this material which I have submitted for the dissertation module of the Degree of MSC in Quality and Safety in Health Care Management is entirely my own work and has not been submitted earlier as an assignment at this or any other university’.

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Abbreviations:

NSI: Needle stick injury/ incident

HCW: Health care workers

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Abstract

This proposed organizational development project is designed to implement online reporting system for needle stick injury in accident and emergency department. Needle stick report is a formal report written by practitioners, nurses, or other staff members (Hynes J, 2009). A previous survey was done to evaluate the prevalence of needle stick injury and reporting rate, showed a high rate of underreporting and this was the catalyst for proposing this project. Cause and effect model (fishbone) was used to cluster the main causes of underreporting by using the present hand writing form. This initiative was driven by the need to maintain a safe environment for the staff which is highly correlated with patient' safety by replacing gradually the existed blaming culture to safety culture. The HSE change model (2008) guided the proposed methodology of the change process. The proposed short term objectives will be evaluated by using a system model of evaluation (1971) where the performance indicators are specified. The proposed long term objectives will be evaluated by using the Kirkpatrick Evaluation Model (1994) as it will guide the evaluation of the impact of the project from different aspects. This proposal recommends making the post exposure follow up and related vaccines as a requirement for renewal the license. Also, replacing the regular available needles with needless IV connector or self-re-sheathing needles that prevent needle stick injury.

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Chapter 1: Introduction

1.1. Introduction

“The effective use of information technology (IT) is essential for the provision of high quality care in the increasingly complex health care field” (Martin et al, 2004). A new on-line reporting system through “Health Information Directorate” for needle stick injury is being proposed to replace the exist hand writing form as a change project in the accident and emergency department in one of the governmental health care organization in Kingdom of Bahrain. This introductory chapter will provide a brief description about the organization, context of the change, rationale behind it, its aims and objectives, and finally the main role of the Student in the Organization and the Project.

According to Hynes (2009) Incident reporting is an official report written by practitioners, nurses, or other staff members whenever they were being exposed to the incident. Where Needle Stick Injuries (NSI) is defined by Muralidhar et al (2010) as wounds caused by sharps such as hypodermic needles, blood collection needles, IV cannulas or needles used to connect parts of IV delivery systems. While Bandolier (2003) believe that it is the introduction of blood or other possibly infectious body fluid by a hollow borne needle or sharp instrument, including but not restricted to needles, lancets, scalpels, and contaminated broken glass into the body of a health care worker, during the performance of his or her duties. Similarly, Lum et al (1997) defined NSI as a penetrating wound with a device that is potentially contaminated with another person’s blood or body fluid.

1.2. Organization

The organization (Hospital), is a multi-specialty secondary and tertiary health care facility which provides emergency, outpatient and inpatient care to all citizens and residents of the kingdom. It is the main teaching hospital in the kingdom with more than 1000 beds.

On-line reporting system for NSI is proposed to be implemented in Accident & Emergency Department –of this organization- which is run over three shift (morning, evening, and night). It contains a Resuscitation Room, trauma room, paediatric room, treatment room, five therapeutic rooms, and minor operation theatre. In the department, there is a laboratory and X-Ray departments. The total bed capacity is around 115 beds, the total number of the nursing team is around 200 and the number of doctors is 68. The number of nurses in each shift is 29 to 31 staff, and they will be assigned in different areas on daily basis except Resuscitation Room nurses who will be fixed and then will be rotated every six months. The number of doctors per shift is thirteen with one shift in-charge and one team leader. The total number of patients per day is fluctuated between 800 to 1000 visits, so around 266 to 333 patients are being seen in each shift. Besides this overload, the department suffers from a lot of patient's related problems, staff's related problems, and organization's related problem. The main problem that worsens the department situation and affects the quality of services and patient's safety is patient's length of stay, as some patient will remain for ten days in the department because of bed shortage in the hospital.

1.3. Context of the Change

In general, reporting any incident is very crucial because it alerts the organizational administration and risk management team about the issues that needs to be investigated to prevent the occurrence of similar incidents in the future (Hynes J, 2009). “Needle-stick injuries are a hazard for all health care worker in the clinical arena and are a risk of potential transmission of blood-borne pathogens following an inoculation injury” (Trim J., 2004).

The main change I proposed to implement is to increase the number of reported needle-stick incidents among Accident & Emergency nurses by replacing the available hand writing form to a new on-line reporting form through intranet system. Initially, I will distribute a questionnaire to evaluate the following matters:

- Prevalence of needle sticks injury.
- Prevalence of reporting needle sticks injury.
- Staff behavior towards reporting incidents.
- Causes for underreporting.
- Nurses awareness about the current reporting system.

Then, on-line form will be formulated and permission will be taken from Research Technical Support Team, hospital and nursing administration, Quality Department and Infection Control Unit to up-load the form in the intranet system by Health Information Directorate. After that, a workshop will be coordinated with the Quality Committee of the department to:

- Discuss the results of the questionnaire.
- Explain the importance of reporting needle-stick incidents.
- Clear up the main hazards of needle stick incidents.

- Clarify the new on-line reporting form.

1.4. Rationale for Carrying out the Change

"Research has shown the accident and emergency department to be a particularly problematic environment where safety is a concern due to various factors, such as the range, nature and urgency of presenting conditions and the high turnover of staff" (Tighe CM et al, 2006). This conforms to what is discussed by Gourni P et al 2012 that staff in emergency department is at high risk as it is a challenging and hard unit with heavy task of work. "The true magnitude of NSI is difficult to assess in the absence of an integrated and careful monitoring system" (Mohammadi, 2011).

Before writing this proposal, I have reviewed some surveys' results that have been done previously in the department. One of those surveys was done to evaluate the urgency and the need to change the available reporting system of needle stick incidents in-order to improve the reporting rate. This survey include the prevalence of needle stick injury, prevalence of reporting, causes of not reporting, suggestions to improve both the reporting rate and existing process of reporting. Twenty nurses were included in that assessment. The demographic data of nurses are presented in Figures No1, 2, & 3.

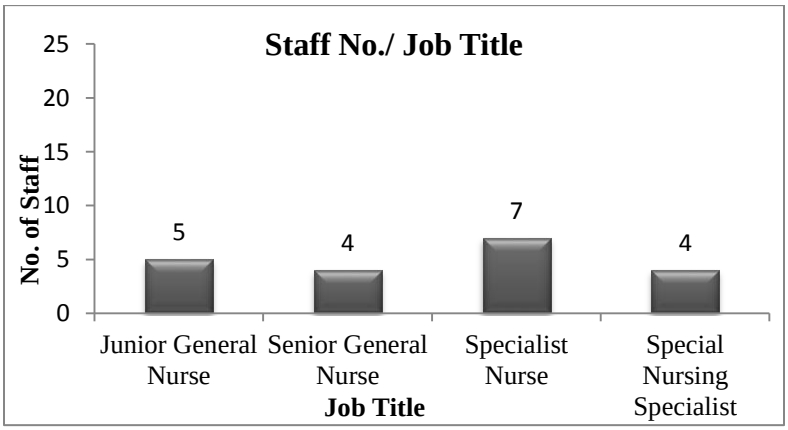

Figure No. 1: Job title of staff involved in assessment

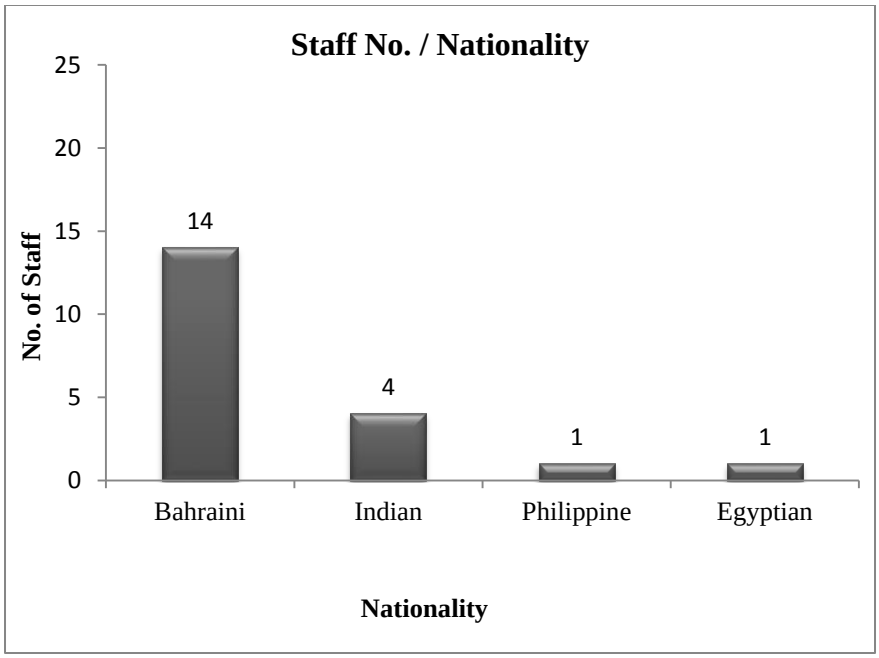

Figure No. 2: Nationality of staff involved in assessment

Figure No. 3: Years of experience of staff involved in assessment

The results show that twelve nurses did not get needle stick during their work lifetime, while eight nurses were exposed to needle stick. Out of eight who got needle stick injury, only two nurses had reported the incident through the official reporting system. The nurses believes toward the causes of not reporting were varies and shows in cause-and-effect (fishbone) diagram figure No.4. One nurse from those who did not report declared that she did not report the incident because she was pregnant, while another acknowledged that the needle was sterile and he got the incident before needle usage.

Concerning the nurses' awareness about the reporting process, fifteen nurses declared that they are aware about it while five nurses are not aware. In regards to receiving training or education on the process to follow if they sustain NSI, two nurses stated that they have received while eighteen nurses did not receive. The nurses behavior toward reporting NSI in the future time was also assessed, and this displays that eighteen nurses agreed that they will report, one will not report, and one do not know if she will report or not. Nurses were also asked to give suggestions to improve the reporting rate and those suggestions presented in table No. 1

Suggestions	Staff No.
Education about the process of reporting	7
Education about safe use of needles	1
Education about the effects of NSI	1
Make the process more easy	1
Make the process through on-line	1
Reduce paper work	3

Table No.1: suggestions to improve the reporting rate

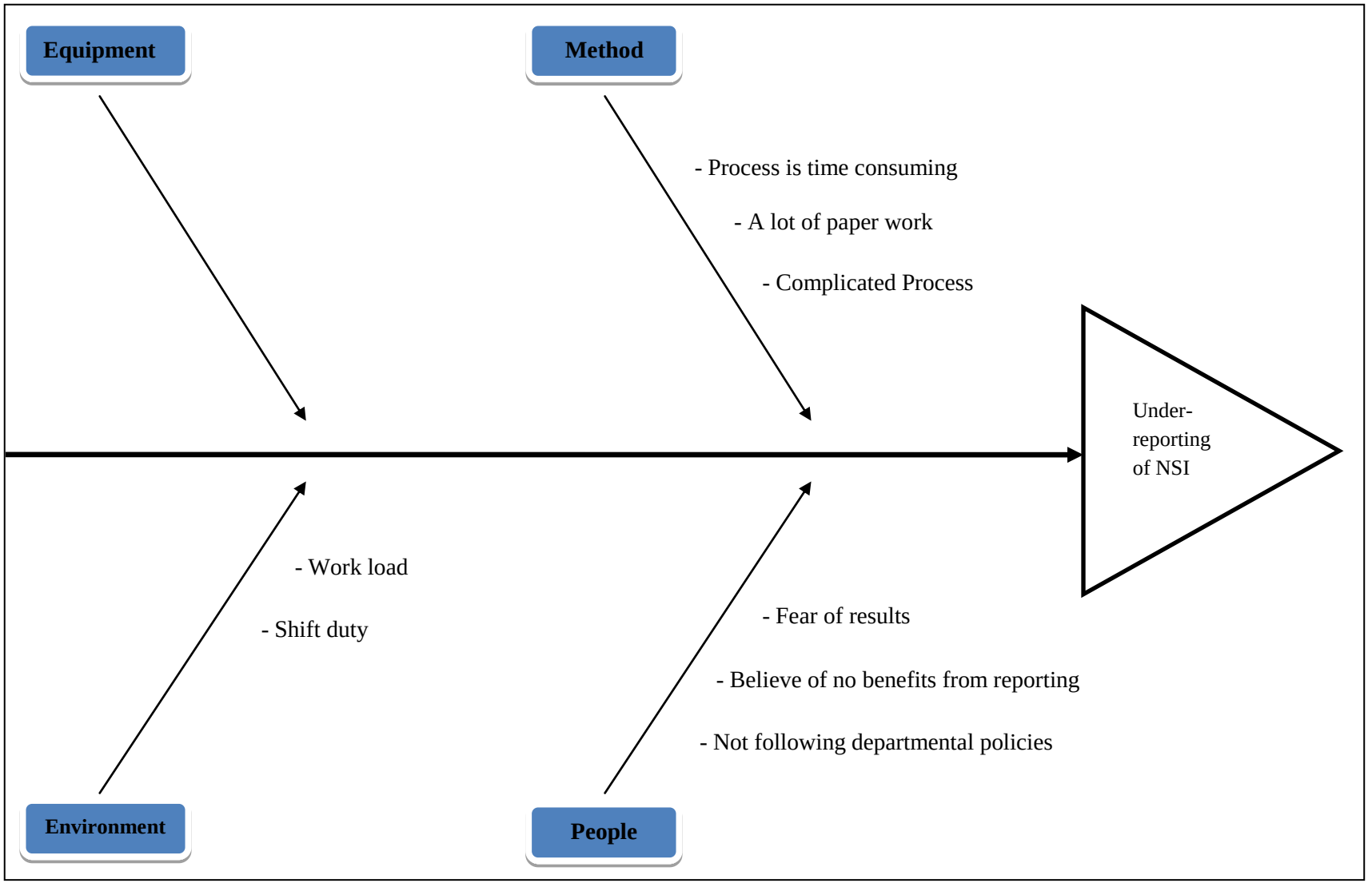

Figure No. 4: Cause & Effect (causes of underreporting needle stick injury)

Nurses were lastly asked to give suggestions to improve the existing process of reporting NSI, and suggestions presented in table No. 2

Suggestions	Staff No.
Easy the access of the process	1
Make staff clinic	2
Reduce paper work	1
Faster the process	1
Make the process through on-line	1
Education about the process of reporting	1
Make ready specific form to fill in	1

Table No. 2: suggestions to improve the existing process of reporting NSI

To sum up, the previous survey shows the high rate of underreporting of NSI in my department and this highlighted the importance and need for implementing this proposed project.

1.5. Aims and Objectives

The core aim of this project is to implement an on-line needle-stick reporting system. This aim will full-fill the following objectives:

- Short Term Objectives:

1- The staff will report any needle stick injury via on-line reporting form through intranet system.

2- Increase the number of reported needle-stick incidents among Accident & Emergency staff.

3- The staff will acknowledge the importance of reporting needle stick injury.

4- The staff will know the causes of needle stick injury and the relationship between work environment and prevalence of needle stick injury.

- Long Term Objectives:

1- Change the nurses' behavior toward reporting needle-stick incidents.

2- Nurses will act in accordance with post exposure follow-up testing and treatment protocol.

After the implementation of my proposed project, Accident & Emergency Department's staff will be more aware about the importance of reporting needle-stick incidents and they will verbalize their satisfaction about the new reporting system and the process of reporting, as evidence by using on-line needle-stick reporting form, increase the number of reported needle-stick incidents, and nurses act in accordance with post exposure follow-up testing and treatment.

1.6. Role of the Student in the Organization and the Project

Within my job title as senior special nursing specialist, I am playing multiple roles in my department. I am covering as acting nurse supervisor during holidays, evening, and night shift, while in the morning shift of normal working days I am working as a team-leader of the department. The main roles of the team-leader are staff assignment, drug replacement, and team organization. Beside this, I am a member in the educational committee, research committee, and quality committee of the department. Moreover, I am a preceptor for the students from the College of Health Sciences since 2007. Also, I am responsible about preparing the monthly and yearly report about the department's achievements, changes, death rate, and overtime consumption. Regarding the project proposal, I will be the change leader of the project as I will be responsible about all phases of planning and implementation. The quality committee members will take the responsibility with me in arranging the workshops.

1.7. Summary

The core aim of this proposal is introducing and implementing an on-line reporting system for needle stick injury, in-order to improve the reporting rate and to change nurses' behavior toward the duty of reporting such injuries. Next chapter will present relevant literature reviews that support the rationale behind this project proposal, followed by a change process through which an HSE model (2008) is being utilized to guide the proposed methodology and actions that should be followed. Then, proposed methods for analysis and evaluation will be discussed and the last chapter will discuss the proposed results and impacts of this proposal implementation on the organization and on practice. Limitations and recommendations will be also highlighted.

Chapter 2: Literature Review

2.1. Introduction: This detailed literature was done in order to establish the proposal context and the rationale behind it and to set the aims and objectives. The searching strategies were mainly through electronic databases as it is the best way to get a lot of material. This was done mainly through Google Scholar, PubMed, and CINHAL. The references of the related articles were reviewed and included. Electronic library of RCSI and journals and books from the College of Health Sciences is used as well. Literature review will be presented under seven main themes.

Numerous words used for the search of relevant literature review, these include: Nurses, health care workers, , needles, needle stick, needle stick injury, needle prick, disposal practices, recapping practices, Infectious diseases among HCWs, blood borne pathogens among HCWs, sharp injuries, occupational exposure, safety devices, reporting, underreporting, online reporting, risk, surveillance, survey, audit, prevalence, knowledge, attitude, automated reporting, nurses behavior, incident report and electronic health record.

Key words: Health care workers, Needle stick Injury, Reporting

2.2. Prevalence of NSI and Groups at Risk:

In United States, The Centers for Disease Prevention and Control (CDC, 2004) estimates around 385,000 NSI among HCWs each year were Bandolier (2003) declared that around 600,000 and 800,000 needle stick and other percutaneous injuries occur in the same country every year but around half of those injuries are underreported. A study conducted in a tertiary care hospital in India by Muralidhar et al (2010), revealed that 80.1% of health care workers sustained NSI in the previous year. This high level of

NSI is also comparable to the incident rate of 130 cases of NSI among 232 nurses over one year in Poznan (Bilski, 2005), and also 73 out of 138 HCWs (52.9%) reported NSI in Iran (Mohammadi 2011). Similar results of high NSI rate were shown in a study conducted in China were 86% of nurses declared that they were being stuck by needles and splashed by body fluids (Chen & Han 2010).

A significant survey with 4,407 participants was accompanied by Royal College of Nursing 2008 found that 48% had experienced NSI by used needles and this percentage considered high. As well, 45% of participants declared that they did not receive training on safe needle use. A study conducted at University Hospital of the West Indies to explore the prevalence of NSI and its reporting rate among HCW shows that 78% of medical doctors and 64% of nurses admitted NSI and around 81.5% of all respondents had splashes from bodily fluid (Vas et al 2010). Similar results of high level of NSI and exposure to blood is proven in a study carried out in six hospitals in Attica at emergency department shows that 87.1% of the sample reported exposure to body fluids or blood during their entire career, while 50.9% reported exposure during last six months (Gourni P et al 2012). A study conducted in Southwestern Germany in 2007 to evaluate the prevalence of NSI among HCWs, revealed that 448 NSI were reported (Hoffmann et al 2013).

A cross sectional survey carried out in Korea likewise the high rate of NSI as other studies in other region where 432 NSI reported by 263 nurses and this means 1.31 events/nurse/year (Smith et al 2006). High rate of NSI was also proven in a study conducted in Uganda where only 18% out of 526 nurses and midwives did not experience NSI in their total professional years (Nsubuga & Jaakkola 2005). Brewer

2003, granted with other studies that show high level of NSI. He did surveillance for twelve months that discovered about 1,445 NSI in fourteen health services.

Nurses have the highest risk to sustain NSI (Bandolier 2003, Brewer 2003, Canadian Centre for Occupational Health and Safety (CCOHS) 2005, Hsieh WB et al 2006, Tabak et al 2006 & Hoffmann et al 2013). Muralidhar et al (2010) explain that among all health care workers who participated in the study (428), nurses had the highest percentage of NSI 100%, followed by junior residents 87.5%, nursing students 85.3%, laboratory technicians 84.3%, interns 82.7%, senior residents 80%, and lastly undergraduate students 53.3%. In dependence to work place, nurses who are working in dialysis units and emergency medical care have the highest rate of NSI (Bilski 2005). However, Galougahi (2010) identified that operation room had the highest occurrence, while emergency department and intensive care unit were the second highest.

2.3. Prevalence of Reporting of NSI:

American Nurses Association (2002) illustrate that it is essential for nurses and all health care workers to report and document every needle-stick to ensure timely post-exposure follow-up such as testing and treatment, collect data to assess the safety measures of the workplace, and to forward the data to the Bureau of Labor statistics which initiates national policies, guidelines and rules. It is widely discussed that almost half of NSIs are not being reported, as mentioned by Gourni P et al (2012) that only 34.1% of NSI were reported to the Committee of Infection Disease while 68.3% reported it to the supervisors. Furthermore, a study conducted in Iran by Azadi, Anoosheh, & Delpisheh (2011) identified that only 36.8% from nurses who had needle-stick incidents

had officially reported their experiences. Muralidhar et al (2010) explain that 26% of health workers who sustained NSI among the participants did not report it, while 60% took actions immediately and remaining 14% took action afterward on the same day. Although the majority of HCW were aware about the policies and procedures of reporting NSI, 16% did not report and out of 84% who reported it only 59.5% received post exposure treatment (Vas et al 2010). Ball & Pike (2008) declared that only 19 cases in the survey did not report the incident as they believe the incident had a very low risk of transmission of any pathogens, while three cases they did not report as they were not aware that they have to report such incidents. Unfortunately, almost half of nurses who reported the incident did not have their blood test after the incident, and around 23% among those who tested their blood they did not follow up.

Though NSI is relatively frequent among HCWs, but staff does not report the incident in spite of their consciousness about the risk of getting many infections and diseases (Tabak et al 2006). Bilski (2005) shows a higher level of underreporting as 50% of all NSI were orally reported only and not through the official reporting system. Brewer (2003) had highlighted and agreed with the others that there is a significant under-reporting of NSI among HCW. Furthermore, NSI statistics are not accurate and can't be reliable because of 40 to 70% of NSIs are underreported (Osborn et al 1999).

Inopportunely, under-reporting of needle stick injuries is not only among nurses but also among other health care workers as shown in the results of a cross-sectional survey in Jordan that 66.5% of the participants (dentists) had NSI and 77.9% of those did not report it (Kader et al 2009). Moreover, a study conducted in Israeli hospital aimed to identify the relationship between HCW beliefs and failure to report NSI shows

that Auxiliary staff has the highest rate of compliance with reporting NSI, while doctors have the lowest compliance rate (Tabak et al 2006).

2.4. Causes of Underreporting:

Azadi, Anoosheh, & Delpisheh (2011) vrified that 33.3% of nurses who did not report NSI was because of dissatisfaction with post exposure follow-up, while 29.2% was because of considering NSI as low risk as a source of infection. Tabak et al (2006) explore that failure of HCWs to comply with the reporting system of NSI was related with believes that reporting such injuries need too much time. A survey done among 300 nurses and doctors displays that underreporting was because of workload pressure, time restriction and an organizational culture of silence towards NSIs (Elmiyeh et al 2004).

2.5. Effects of NSI:

Uncertain effects and undistinguishable consequences of needle stick injuries among health team members are mainly due to underreporting of the incidents (Azadi, Anoosheh, & Delpisheh 2011). CCOHS (2005) agreed with them that the problem of needle stick injury is being underestimated because many HCWs do not report it. Thomas & Murray (2009) explain that needle stick incidents are associated with significant risk to our career, health, families, and patients. NSI is the major mode of transmitting blood borne pathogens such as hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) (Clarke SP et al 2002, Bandolier 2003, Wilburn 2004, Bilski 2005, Nunnelee 2005, Nsubuga & Jaakkola 2005, Tabak et al 2006, Rapparini et al 2007, Royal College of Nursing 2008, Pope 2009, Galougahi 2010,

Muralidhar et al 2010, and Mohammadi 2011). WHO (2002) reported that “2.5% of HIV cases among health care workers and 40% of hepatitis B and C cases among HCWs worldwide are the result of occupational exposure”. Similarly, Pruss-Ustun et al (2003) clarify that almost half of all hepatitis B and C among HCWs in Africa and Asia and more than two-third of all hepatitis B in central and South America are because of contaminated sharps and occupational exposure. Other diseases that might be transmitted via NSI include malaria, diphtheria, syphilis, brucellosis, tuberculosis and herpes virus (Muralidhar et al 2010 & Goniewicz et al 2012).

Moreover, HCWs who had NSI suffered from stress, fear, and anxiety about the possible consequences of NSI and getting HIV without being aware of it (Nunnelee 2005, Worthington et al 2006, Ball & Pike 2008, Royal College of Nursing 2008, Chen & Han 2010 & Muralidhar et al 2010). Even when NSI did not transmit any infectious disease, its emotional effects can be severe and permanent (Bandolier 2003). Other consequences include being more cautious, taking better precautions, and some of them avoiding such procedures. Also, around 34% tried to improve their knowledge through reading articles about avoiding NSI (Muralidhar et al 2010). Cost also is another sequence of NSI, which include the initial and follow up testing and treatment (Bandolier 2003 & Zaidi 2009).

2.6. Environmental/ work factors that Increase NSI Occurrence:

Goniewicz et al (2012) verified that the commonest clinical activities that cause NSI was recapping used needles (30%), then intramuscular or subcutaneous injections (22%), and lastly is equal risk in taking blood samples and during intravenous cannulation

(20%). Similarly, Gourni P et al (2012) Rapparini et al (2007) & Adesunkanmi AK et al (2003) declared that NSIs were mainly associated with recapping of used needles followed by the task of removal of medical equipment. Correspondingly, CCOHS (2005) proven that recapping used needles can be considered the single most common cause for NSI and can account for 25% to 30% of all NSIs among nurses and laboratory staff.

Whereas, a cross-sectional study in Tehran shows that injections were the most common procedure lead to NSI (24.44%), and recapping used needles was the second higher risk (21.11%), but the basic reason for NSI was patients crowdedness and hospital chaos (37.8%) (Galougahi 2010). In addition, Galougahi (2010) indicated that male nurses recap used needles more than female nurses and used latex gloves during the procedures less than female. Muralidhar et al (2010) discuss that blood withdrawal is the most often procedure associated with NSI (55%), followed by recapping needles (39%), suturing (20.3%), patient aggressiveness (13%) and the least is during vaccination (11.7%). On the other hand, CDC(2004) studies shows that recapping needles (6%) is the lowest cause for NSI and manipulating the needle in the patient (26%) is the main cause, while Brewer(2003) explain that 3.3% of all NSI were because of recapping needles. Bilski (2005) revealed that the most NSI occurred during the removal of the needle from the syringe. Almost same circumstances but different percentage were associated with risk of NSI presented by Adegboye et al (1994) include unpredicted patient movement in (29%), discarding of used needles in (23%), recapping needles in (18%), unintentional stick by a colleague in (18%), and needle disassembly in (10%).

Moreover, Kader et al (2009) claimed that NSI was mainly related with old age and higher number of patients. Similarly, Nsubuga & Jaakkola (2005) identified that working long hours more than 40h/week and lack of training is associated with high NSI rate. On the other hand, a cross- sectional survey in Korea proves that younger nurses (less than 27 years) were 4.5 times more likely to get NSI and working shift duty increase the risk to experience NSI (Smith et al 2006). By the same token, CCOHS (2005) reported that new staff and students tend to get more NSI. In contrast, Galougahi (2010) revealed that his study verify no relationship between ages, gender, years of experience, educational level and NSI. Clarke et al (2002) enlighten that staff shortage is a leading factor for sustaining NSI and thus putting the patients and HCWs at risk.

The majority of NSI occurred in the second third of the duty period (Bilski 2005 and Muralidhar et al 2010). A recent study shows that almost half of the NSI (52.8%) take place during evening shift while 30.6% in morning shift and only 16.7% in night shift (Gourni P et al 2012).

2.7. Methods of Preventing NSI:

Maccannell et al (2010) consider the safety of health care personnel as a challenge that should be encountered by multidimensional methods of prevention. Elmiyeh et al (2004) believe that preventing NSI is the responsibility of both organizations as they have to provide safe environment, educational programs, and to put into effect NSI reporting, while HCWs should adhere to guidelines during dealing with sharps. According to CCOHS (2005) needle stick injuries can be prevented through application of a comprehensive NSI prevention program that include employee training and

addressing risk of injury, potential hazards, and procedures of reporting injuries. Azadi et al (2011) agreed also that persistent staff training is the best preventive strategy, while standardizing post exposure procedures is highly recommended.

2.8. Advantages of on-line Reporting system:

Unluckily, I did not find direct researches or studies that discuss the effects or impact of reporting needle stick injury via electronic system, but there are a lot of studies concerned about using electronic record in health system. Also, there are studies concerned about reporting patients' incidents via electronic systems and its important in improving the patient safety and care quality. Shekelle et al (2006) and Jha et al (2009) have pointed that electronic record system lead to higher quality through efficient and safer care system. Whereas Chaudhry et al (2006) and Blumenthal & Glaser (2007) deliberate that the electronic record system has the ability to improve the efficiency and effectiveness of health care providers. In addition, Hiller et al (2011) discuss that applying electronic health records is important in changing the delivery of health care especially in those related to cost saving matter. Bates et al (2003) claimed that stakeholders in United States health systems have realized the importance of starting electronic health records for all health care establishes. Friedman et al (2013) discuss that the optimum benefits of electronic health records can be achieved through standardization of the electronic health records, reporting methods, and legal authority for using electronic health records.

On-line reporting system compared to paper-based system, has many advantages as claimed by Geradi (2002) it can be submitted immediately without delay and to quite a

lot of addressed departments concurrently, and this will allow the organization to analyze the data and respond to the incidents faster and in a more coordinated way. Similarly, Work Safe BC(2014) explain that on-line reporting avoid delay that is associated with other reporting system. Also, it discuss that the information can be saved, updated later on, secured and accessed by legible personnel. Furthermore, it does not cost extra money if the internet service is available in the organization, and lastly it helps in preparing the statistical reports.

Blumenthal & Tavenner (2010) believe that transition and shifting to electronic records is not easy and the significant use of it is more important than adopting and accepting it. To overcome the employee resistance of using on-line reporting system, Hamid & Cline (2013) clarified that employee involvement and management support were highly associated with employee acceptance and support of the electronic health record system. This matter was also proven by Morton (2008) that there is a positive relationship between employee involvements, management support and employee adoption of electronic health record. Addition to that, adequate training has positive impact on employee's acceptance to the electronic record system as pointed by Hamid & Cline (2013).

2.9. Summary:

The literature on needle stick injury and the main scopes and themes have been outlined. The majority of the studies showed that there are high rate of needle stick injury correlated with low reporting rate. Electronic reporting is the proposed method that could solve this problem and improve the health care workers safety. The next

chapter outlines the proposed methods in the implementation of on-line Reporting form for needle stick injury via intranet system in the Accident and Emergency Department.

Chapter 3: Methodology

3.1. Introduction:

This chapter will outline the proposed change model and related activities chosen to implement the proposed project. Also, it will describe some challenges that might be faced and how to overcome those challenges during the real implementation.

3.2. Application of Organizational Development Model:

Health organizations need to improve the quality of their services and to keep on effective and efficient in order to meet their internal and external client's demands and exceed their expectations. This detailed plan project is being written and guided by HSE organizational development model (2008) figure no 5. Although this model developed to fit with the Irish health system, the writer selected it because it is people-centered model that build the change on stakeholders involvement. Also, it is a cyclic model, which reflects the continuity of the process that stimulates the continuous evaluation and feedback. The Health Service Executive (2008), believe that HSE model designed to improve patients and health team members experience and promotes the teamwork culture in the organization.

3.2.1. Initiation: The preparation for this proposed project is too critical because the success of the project is depending on a focused well-prepared plan. At this stage the author will talk over about the drivers of proposing this project, key stakeholders, initial assessment, and the required resources.

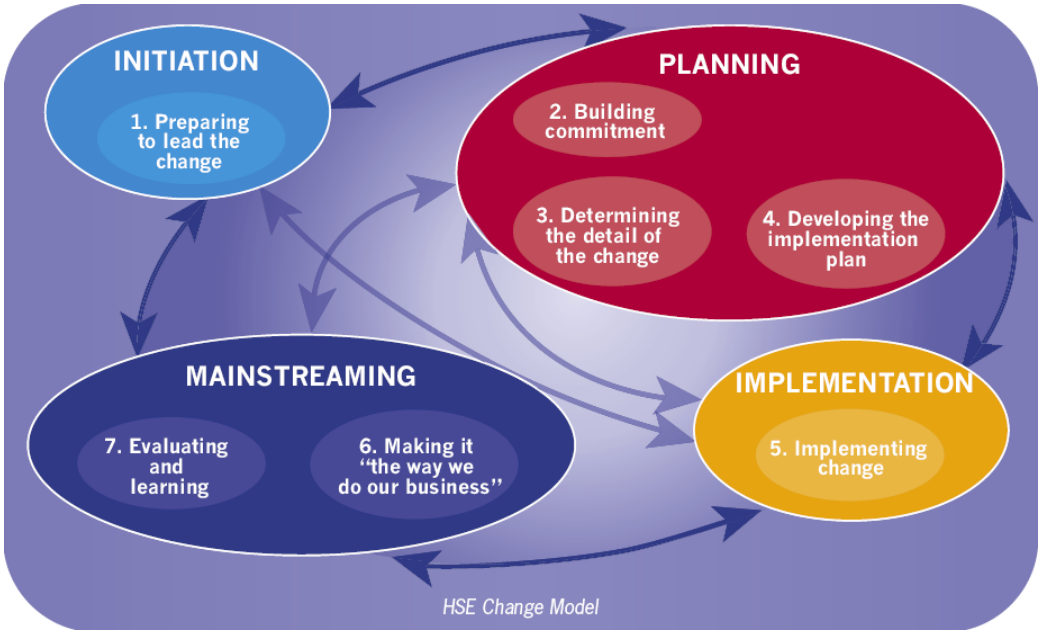

Figure No 5: HSE organizational development model (2008)

- ***Drivers and Resisters of proposing this project:*** To be aware about the most important factors that drive the author to propose the project of on-line reporting system and the possible obstacles and variables that might impede or interact with the implementation of this proposal, Force Field Analysis (Lewin 1951) used as a tool to map the possible drivers and resisters. Refer to Appendix no. 1.

The current method of reporting needle stick incident is the main driver. According to the Infection Control Unit and Occupational Health Unit in the Ministry of Health any exposure to needle stick or blood and body fluid should be reported. First, the exposed staff should attend the nearest accident and emergency department within one hour of the injury. Second, to fill the incident, pension funds commission (GOSI) forms. Then, the staff will contact Infection Control Unit for entrance of data into EpiNet and will be referred to Occupational Health Unit for post exposure follow up. The follow up will be at

three months, six months, and twelve months. This process of reporting the incident is time consuming as the nurse should attend physically to Infection Control Unit and Occupational Health Unit. Likewise, if the staff did not comply with the post exposure follow up no unit is responsible to contact or follow him.

Also, the standing form that is being used at present is another driver. Internationally, each hospital has a special form for reporting needle-stick incidents, but in the author's hospital there is no specific form. The form which is being used now is to be used for reporting all types of incidents such as trauma, fall, assault, and involve in road traffic accident while coming or leaving the duty (Appendix no.2). Besides, there is another form from Civil Service Bureau to be filled by the exposed staff, but this form written in Arabic only while 75% of the author's department staff is non- Arabic reader or writer (Appendix no.3).

Moreover, technology arise (Electronic Health Record) considered a vital driver toward changing the reporting method. Ministry of Health is moving towards computerized system at health care delivery system through the effective use of Information Technology and Electronic Health Record. The application of on-line reporting system will be part of this operational step. In addition, all data related to the incidents can be stored and used when needed, accurate statistics can be done and annual reports will be more resourceful through Information Technology system. Electronic Health Records are hopeful approaches to advance and progress the quality and efficiency in health care (Jha et al 2006).

Bahrain National Code of Professional Conduct for Nursing (2002) is as well a driver as it encloses some core values that guided the nurses throughout their work lifespan. One of those values is accountability, where the nurses are accountable for their contribution to the development of the nursing profession.

Additionally, The Head Nurse of the author's department motivates the staff as she is the head of the quality, research, and educational committees and is highly inspired and supportive toward any project that aims to improve the quality of the services. This atmosphere encourages the author to propose this project. Loo (2003) emphasized that leadership support and communication is more significant than organizational enablers for the project to succeed. Besides, reporting through online form will save staff time and effort as they do not need to attend to the concerned units physically. Similarly it will save the cost which is being spent on the paper form.

On the other hand, Kotter and Schlesinger (2008) believe that even with professional managers, some type of resistance will be exist within any organizational change.

Coghlan (1993), NHS Modernization Agency (2005) and Stonehouse (2012) have pointed that resistance is a natural and common response to change. Some nurses in the author's department are not motivated at all to participate in any activities and they refused to be as members in any of the departmental committees. The author is anxious about those people involvement and compliance in implementing this proposal.

Also, increased workload might be raised up after the project implementation, when the nurses are being asked to report needle stick injury in both forms the online form and hand writing form. This resister already exists in the department and being raised up

against reporting of communicable diseases. The nurses were reporting those diseases by hand writing form and after the implementation of online form they were asked to report in both ways.

Identification of Key Stakeholders: People planning is essential as mechanical and economic planning (Roussel et al 2006). The author believes that performing stakeholder analysis at the initial stage has a positive influence in the development of effective plan for this proposed project. Reed et al (2009) explain that stakeholder analysis includes identifying stakeholders, differentiating between and categorizing stakeholders, and investigating relationship between stakeholders. On the other hand, Jepsen and Eskerod (2008) stress on the importance of identifying stakeholders before classifying them. Stakeholders who will have direct relation and involvement in the implementation of this proposed project are presented in figure No. 6.

Jang et al (2009) declared that managing stakeholders with social responsibilities, assessing the stakeholder's needs and constraints to the project, and communicating with stakeholders properly and frequently are the main three factors that affect any project. To gain the internal departmental commitment, the author had an informal meeting with the departmental head nurse and kept her informed about this proposal. The head nurse greeted the idea of the project and showed her support in matter of allowing the usage of the available resources, meeting with staff, and making the project

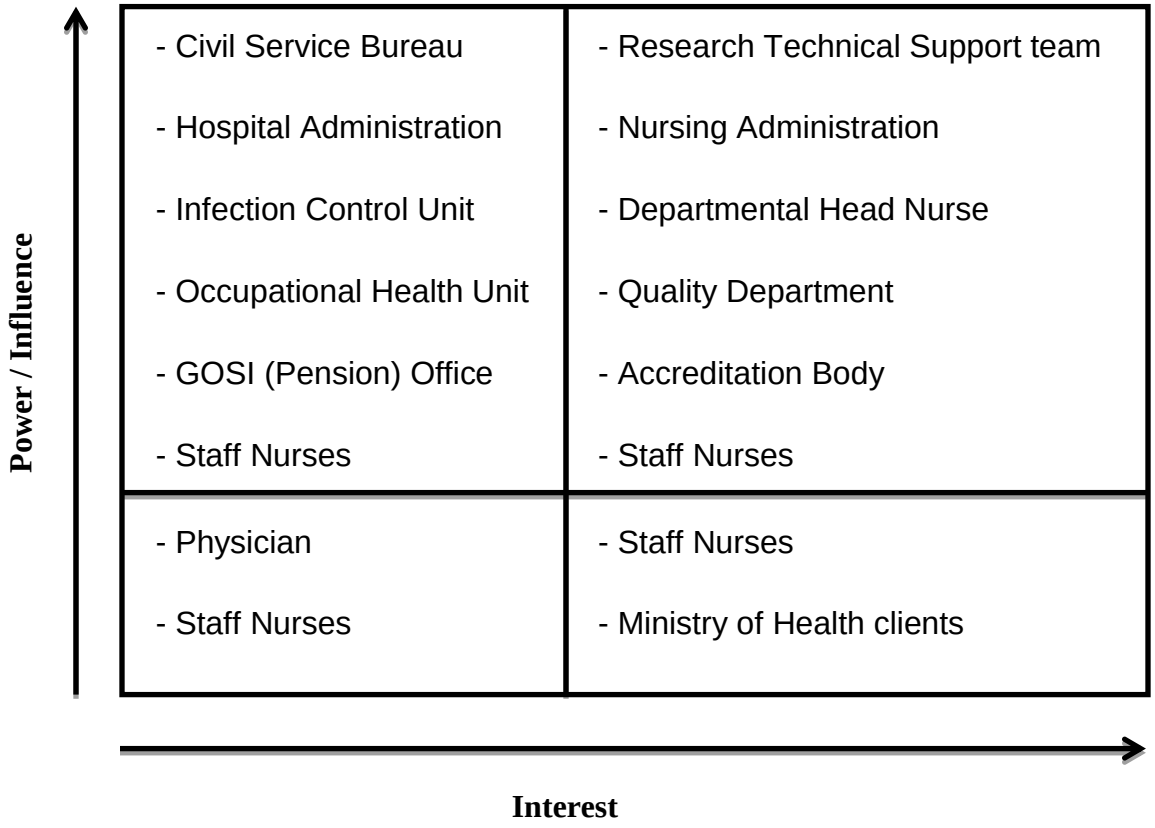

Figure No.6: Stakeholder analysis

as an achievement of the quality committee of the department as she is the head of the quality committee and the author is a member in it.

Project Impact Statement:

The anticipated impact of the proposed change is presents in table No. 3. This assessment is valuable as it can be used as an evaluation tool after the implementation to measure the degree of achievements.

Change Aspect	Current Situation	Transition from current to future	Future Vision
Process	- Staff should attend physically to the Infection Control Unit and Occupational Health Unit after finishing from the medical treatment in Accident and Emergency Department.	- Still staff has to report after finishing from the medical treatment in Accident and Emergency Department.	- Staff will report through on-line system and the form can be forwarded to all concerned units.
Form	- There is no specific form for needle stick injury. - The form that is belongs to Civil Service Bureau is made in Arabic only.	- Initially both forms (on-line and hand writing) might be needed.	- A specific ready form to fill in will be uploaded in the intranet of the hospital.
Rate	- There is evidence of underreporting of needle stick injury.	- Workshops and educational lectures will be arranged to motivate staff to report NSI through on-line form.	- The reporting rate will be more as the process changed to be simpler.
Knowledge	- Most of the staff did not receive education or training about the process and importance of reporting	- Workshops and educational lectures will be held	- Staff will be knowledgeable about the process and importance of reporting NSI.
Behavior	- Staff is not motivated to report and this behavior is affected by their believes.	- Workshops and educational lectures will be held	- Improve the level of knowledge will be followed by behavioral changes towards reporting NSI. The staff will report any NSI through on-line form.

Table No. 3: Adapted from: Health Service Executive (2008)

Identification of the Required Resources:

- Computer Devices: Computer Devices are needed to implement this proposed project, as it will be through using an on-line form via intranet of the hospital. Nonetheless, to implement this we will not need to purchase the devices because it is already available in the department. In each therapeutic area there is minimum of one computer device.

- Computer Skills: All staff is able to use the computer and at present now they are reporting all communicable cases to the Infection Control Unit through on-line form only.

- Time: Reporting through on-line will save the staff time as it will not take more than five minutes, while physical attendance to Infection Control Unit and Occupational Health Unit is time consuming. Similarly, the time between the exposure and reporting will be less as the staff can report the incident immediately from the department itself. According to GCC Centre for Infection Control (2008) the time of reporting should be within 24 hour from the exposure and prophylaxis to be initiated within 48 hours.

- Information Technology (IT) Personnel: IT Personnel are needed to upload the form through the Intranet system of the hospital.

3.2.2. Planning:

Determining and identifying how the organization can get where it wants to be, and what it will do to achieve its objectives is the process of planning (Management Innovations 2008).

Building commitment:

The purpose of this step is to gain first the leadership support and commitment toward implementing this proposal. Building a shared vision is the key for any plan to succeed. Ransom et al (2008) clarify that everybody in the organization must understand how the future will be like and what they will have to do to accomplish the future state and this could be achieved through establishing a vision and generating a new strategies and activities.

At this stage the author believe that the best way of building a shared vision will be through arranging a planned meeting with Head nurse, quality committee, and educational committee members to gain their support and by that they will feel they are the owner of the project. Ransom et al (2008) have faith that senior leadership is responsible to communicate the vision, so during the monthly departmental meeting the Head Nurse will communicate the objectives of the project, the actual and the desired state, and the importance role of the staff in order to implement this project effectively. Mc Bain et al (2012) consider most effective organizations have manager who are able to drive high level of employee engagement and involvement in their activities. This group involvement will be more time efficient, because the process of introducing any effective change is time consuming.

***Increase readiness and capacity for change*:** At earlier stage, the author had looked to the previous survey to weigh the importance of this project proposal. The results of that survey will be the basic for selection the desired actions that will create the culture needed for the change implementation. The organizational culture is one of the causes

that affect the project performance and failure (Stare 2011, Anderson et al 2009, and Brown 2008). An external environmental analysis is done by using PESTLE framework. Refer to Appendix no. 4. The internal environmental analysis is done by using SWOT analysis. Refer to Appendix no. 5.

To reinforce the staff commitment toward the project a formal meeting with the staff will be arranged to communicate with them about the scope, objectives, and details of the plan. Discussion and tow-way communication will be encouraged to motivate the staff to give suggestion and flexibility will be shown for any changes that would improve the planning steps. Additionally, staff will be asked to be volunteers to formulate a team for the implementation phase. Dizgh et al (2011) deliberate that empowered staff are motivated, committed, productive and able to adapt to the organizational modifications. Besides that, the author is aware that King Hamad University Hospital is being operated since opening with paper-less system, so a meeting will be requested with its head of infection Control Unit to get recommendations based on their experience.

Developing the implementation plan:

In order to outline the tasks which will be carried to implement this project and the associated time needed, a Gantt chart Appendix no. 6 is utilized. The implementation of this proposed project will be initiated after getting the approval from Research Technical Support Team, Hospital Administration, and Nursing Administration. Then, meeting with the head of Quality Department and the head of Infection Control Unit will be requested to finalize the content and shape of the online form (Appendix no. 7). After that, the Health Information Directorate (IT Personnel) will be asked to upload the form in the

intranet system. Once the form is uploaded, a pilot study will be done in a form of FOCUSPDSA cycle will be done to assess the risk, weaknesses, and strengths of the online reporting form. Alireza (2002) believes that FOCUSPDSA cycle is an effective tool as it will foster people collaboration and the improvement will be founded on facts and indicators (Appendix no. 8). Moreover, Pal et al (2008) have pointed that pilot studies are being utilized to understand, investigate and evaluate acceptance of new project, and therefore allowing managers to overcome invisible problems before the actual implementation period. Prior to the pilot phase, a questionnaire (Appendix no. 9) will be distributed among the staff to evaluate the prevalence of the NSI, prevalence of reporting NSI, the most activities that cause NSI, process to follow if NSI happened, and suggestion to improve the reporting rate and the existing process.

During this period of pilot study, a workshop will be arranged about the needle stick injury and the following points will be addressed:

- The national and international prevalence of NSI.

- The national and international prevalence of reporting NSI.

- The importance of reporting NSI.

- The effects of NSI.

- The process of reporting NSI and the changes will be discussed in depth.

- Post exposure follow- up.

- Prevention of NSI.

This workshop is to improve the staff awareness about NSI. The workshop will be done three times at the first month of the pilot study period because the staff number is large and need to cover all of them. At the end of the pilot study period, a questionnaire will be distributed to evaluate the effectiveness of the new system, and the form of NSI.

Preparing the Proposed Form: As pointed out previously about our need for a special form for reporting needle stick injury, I looked internationally for a ready form that is being used in other hospitals. I found a form which is being used in State of Ohio (Appendix no.10), but it included some information that is not suitable and not needed for my organization especially in the first part of the form which is about public employer information. Consequently, I have developed a special form based on this form and based on the information needed by my department.

3.2.3. Implementation:

Leonard (2004) believe that change needs time and work especially during the implementation and conversion period, where the work increase for some time but when the change has been implemented effectively and efficiently the overall workload will decrease. The purpose of this phase is to deploy in the intranet the on-line needle stick reporting form in the Accident and Emergency Department.

The final form that will be used during this phase will be confirmed with Quality Department and Infection Control Unit according to the pilot study results and staff suggestions, and then will be uploaded by the Health information Directorate in the intranet system. Then, the Quality Committee of the department will invite all nurses to participate and attend a workshop to emphasize again on the importance of reporting

needle stick injury, explain the exact pathway of reporting, and communicate the benefits of using online system. The causes of the changes that would be introduced in the original form will be explained. For a reminding purpose, a booklet will be distributed among all staff even those who were not able to attend the workshop. At the end of the workshop, certificates will be distributed for the staffs who attend to drive them during this phase.

In the department, a poster that present the pathway of the reporting needle stick injury via on-line form will be kept on the information board. In addition to that, the form and the pathway will be kept also in the information and communication book. Along with that, the change leader telephone number and email will be kept for any enquiries. On the other hand, to ensure the continuity of reporting via online form, the nurses will be reminded on monthly bases during the departmental meeting, and will be informed that no paper report will be accepted.

3.2.4. Mainstreaming:

Maurer (1997) believe that most of the organizational change project failure is directly associated to employee resistance. As the plan for implementing the needle stick injury online reporting form was proposed, detailed actions will be planned to deal with any resistance. Kotter and Schlesinger (2008) acknowledge that people will resist the change if they misunderstand the change consequences and perceive that they will lose more than they will gain. Similarly, Bovey and Hede (2001) discuss that irrational believes about the impact of the change is related behavioral intents to resist change. Communication will be the inherent part of this phase.

3.3. Summary:

In this chapter I have discussed how I will follow HSE model to guide me during the implementation. Communication with and involvement of stakeholders at all level was the key for planning an effective methods of implementation. The following chapter will discuss the proposed evaluation methods that would be followed to evaluate the impact of the project.

Chapter 4: Evaluation

4.1. Intoduction:

Kunche et al (2011) and Hughes & Nieuwenhuis (2005) believe that evaluation is the fundamental aspect and important activity of good program management at all levels. Throughout this chapter, a mix of qualitative and quantitative methods will be discussed as proposed evaluation methods. "A system model of evaluation" (1971) will be used to guide these methods.

4.2. Proposed Methods of Evaluation for Short Term Objectives:

In the evaluation process we will not assess only the knowledge that the staff gained from the workshops but we will evaluate their ability to apply what they have gained in their daily work activity. According to Hughes & Nieuwenhuis (2005) the purpose of evaluation can be either about the project justification and accountability or about project improvement. In order to evaluate the short term and long term objectives of implementation of on-line needle stick injury reporting system, justification and accountability will be the main purpose, as this will evaluate the staff accountability and sticking to this project. Also, it will assure its continuation.

The evaluation process will be designed and guided by using "a systems model of evaluation" (1971) Figure no.7. This model of evaluation is a decision focused approach and has been developed by Daniel Stufflebeam and known as CIPP model. This is a very basic system that includes three steps or stages context/input, process, and output/product. Context/input evaluation includes resource assessment and prospective benefits versus cost assessment. Also, it should consist the alternative strategies and

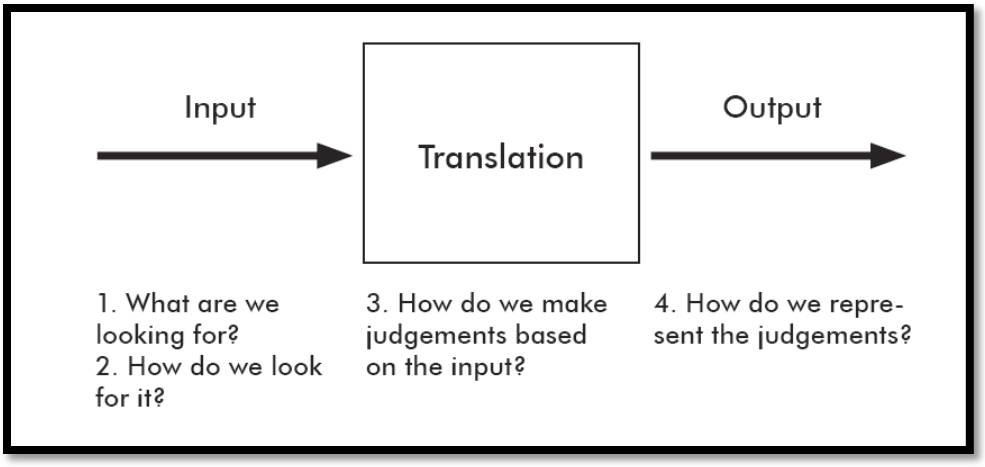

Figure No.7: Stufflebeam (1971), A systems model of evaluation

procedures that should be followed when the project or program failed. Generally, this step helps in planning and making structuring decision. The second stage is process evaluation and it is mainly related to implementing decisions as it will examine the way of project is being implemented, monitored and audited. The last stage is product or output evaluation and it includes examining the specific and general outcomes, assessing retrospectively benefits versus cost, measuring anticipated outcomes, and identifying unanticipated outcomes. Hughes & Nieuwenhuis (2005) believe that this model does not consist of independent function but it is a unified and an integrated process.

Application of A systems model of evaluation (1971):

Phase 1: Input

At this phase I will determine the aspects or dimensions of performance which I am going to evaluate, and what performance indicators I am going to use. Refer to table No. 4

Dimension/Aspect	Indicator
- Objective No. 1: The usage of on-line form.	- Quantitative indicator: Number of staff who reported NSI through online form.
- Objective No. 2: Number of reported NSI.	- Quantitative indicator: Compare the number of incident being reported during six months prior to and post online form.
- Objective No. 3: Staff believe about the importance of reporting NSI.	- Qualitative indicator: The staff decision and judgment about how important is to report NSI.
- Objective No. 4: Causes of NSI, and work environmental factors related to NSI.	- Quantitative indicator: The elements that will be selected by the staff as the main causes of NSI. - Quantitative indicator: The elements that will be selected by the staff as work environmental factors related to NSI.
- Objective No. 5: Nurses behavior towards future willingness to report NSI.	- Qualitative indicator: The staff decision to report any future NSI through online form.
- Objective No. 6: Post exposures follow up.	- Quantitative indicator: Number of staff who will follow the post exposure follow up.

Table No. 4: Performance indicators

Second part of this phase is determining the data collection method that I will use to look for my pre-set indicators. The main tool I am proposing to use is questionnaire.

Nieswiadomy (2012) pointed that questionnaires are useful method to assess knowledge, beliefs, attitudes, opinions, and feeling of the participants. In addition, Hughes & Nieuwenhuis (2005) discuss that questionnaires are tools that can be used to collect information quickly and easily from a large sample, are not expensive, and easy to compare and analyze the results. On the other hand, Nieswiadomy (2012) and Hughes & Nieuwenhuis (2005) had agreed that it is difficult to develop and design a good and well-structured questionnaire. Also, it is inflexible, impersonal and the exact feedback might not be got.

- Developing the Questionnaire: For designing and developing the proposed questionnaire I did not get a ready sample that I could use, so three questionnaire samples were used to guide me to develop the proposed questionnaire. Two samples were used by Centers for Disease Control and Prevention during the event of "The stop Sticks Campaign". The third sample is "a guide to evaluating one to one continuing professional development for writers and literature professionals" by Schwarz (2008). Also, the questionnaire developed with guidance by Nieswiadomy (2012) in "Foundation of Nursing Research" book.

Study subjects: Nurses working at Accident & Emergency Department without any exclusion criteria, as all are illegible to participate in this project. Including criteria is registered nurse working in Accident and Emergency Department.

Study design: Mix of quantitative and qualitative design will be used.

Sample size: Sample size will be 50% of the total number of nurses working in Accident and Emergency Department will be asked to participate by answering the

questionnaire. Ideally 10% of the total population is required as discussed by Nieswiadomy (2012) but then the sample size will be not sufficient to evaluate the wanted variables (a little bit larger sample size will be involved to allow for nonresponse or subject dropout).

Sampling technique: Convenience sampling will be used as the available readily nurses will be asked to answer the questionnaire. This method will be used to save time as the nurses in the department are multi-national, with different years of experience and it is difficult to get a representative sample. Nurses who will participate in the study will be approached during their duty time (they can fill the questionnaire at the same time or can be taken and filled later according to their convenience).

- Interview: 10% of the total sample will be interviewed to assess their knowledge about the post exposure follow-up testing and treatment protocol. Also, to assess their satisfaction level about the new on-line reporting system and the way it was implemented.

*** Questions to assess the nurses knowledge about the post exposure follow-up testing and treatment protocol:**

1- After sustaining a needle-stick injury, what is the first step you should do?

2- What is the maximum time you should take to seek the medical help?

3- What are the forms that you should fill?

4- What is the clinic that you should be followed by?

5- How long is the interval between each follow up?

*** Questions to assess the nurses' satisfaction level about the new on-line reporting system:**

1- Is there any difference between the paper reporting form and on-line reporting form?

2- Which form do you preferred?

3- Are you facing any problems with on-line reporting form?

Phase 2: Translation

The data which will be collected in previous phase will be analyzed and presented at this phase. The stakeholders that will be involved during the formation presentation will include the staff of the department, Infection Control Unit personnel, and Quality Department personnel. To check the reliability of the staff answers and their actual behavior toward reporting system, a comparison will be done to assess the differences in the responses and statistics from Infection Control Unit. Descriptive statistics will be used to organize and summarize data gathered from the samples. Measures to condense data and measures of central tendency will be used, and these include frequency distribution, mean, mode, and bar graphs.

Phase 3: Output

At this phase we will show and disclose the results of the evaluation process by arranging a workshop to highlight the changes that will be finalized. The changes on 'evaluation product' will be in three aspects:

1- Physical product: The finalized online form will be the physical product of the evaluation process and will be disseminated throughout the department rooms and in the workshop.

2- Activity: The process of reporting needle stick injury will be through filling the online form and send it through intranet system to Infection Control Unit, Quality Department, and Occupational Health Unit.

3- Content: The content of the form is the international needed information to complete the reporting of needle stick injury.

4.3. Proposed Methods of Evaluation for Long Term Objectives:

From the planning till the implementation and evaluation, the proposed long term objectives will be kept known to all staff, to help both the staff and me as an evaluator to know what variables we are looking for. The staff behavioral consequences of implementing this proposed project are kept as long term objectives because they are being changed slowly within the organizational culture change and after the knowledge gain. To evaluate the long term objectives the Kirkpatrick Evaluation Model (1994) will be used. Refer to figure no.8. This model is developed to evaluate training programs. The model consists of four levels. The first level is reaction, where the evaluators assess the thoughts and feelings about the program. The second level is learning where the knowledge of the employee is being assessed. The third level is behavior and it includes behavioral assessment toward implementation and application of the program. The last level is the results where the assessment is being done to evaluate the effects

of the program application on the organization. The details and explanation of the model in relation to this proposed project is presented in appendix no11.

The data will be collected through distributing a questionnaire to assess the staff's knowledge and behavior towards reporting needle stick injury through online reporting form. The data for second objective will be obtained through a meeting with the occupational health unit as they are responsible about the staff follow up. The data which will be collected include the number of staff who followed the post exposure protocol.

Figure No.8: The Kirkpatrick Evaluation Model (1994)

4.4. Summary:

The evaluation chapter outlines the proposed methods of evaluation. The results of this evaluation are crucial and will show the importance of adoption the electronic report system for needle stick injury. The next chapter will outline the strengths and weaknesses of proposing this project, followed by the recommendations.

Chapter 5: Discussion & Conclusions

5.1. Introduction:

The acceptance and adoption of on-line reporting system for needle stick injury is part of the ministry's vision for moving toward electronic record system that has been started and implemented since few months at local health centers. In this chapter the implications of implementing on-line reporting system for needle stick injury on the organization and on clinical practice will be discussed. Strengths and weaknesses will also be considered.

5.2. Implications of the Project on the Organization:

The dominant culture in my department is the blaming culture where the staff is being blamed for any mistake, but no investigation will be done to discover the root causes of this mistake even if it is related to the organizational system or to the processes. Once the educational program and workshops that will be held prior to the implementation of this proposed project started, the staff will believe that they are the most important stakeholder in the department. Those workshops will stress on the staff safety during the work time and the way of dealing with the sharp instruments, the way of dispensing, and the process that should be followed when they got needle stick injury. The blaming culture will be gradually replaced by safety culture. This reflects what is discussed earlier that organizational culture is one of the causes that affect the project performance and failure (Stare 2011, Anderson et al 2009, and Brown 2008).

In addition, if the proposed project is implemented there will be accurate statistics from the Infection Control Unit as all information related to the incidents will be presented in a

special ready form and will be submitted only if all needed information is entered. Also, they will be able to get a separated statistics for each department or ward and identify the ward with more incidents which need more training and educational program. This electronic report system is improving the quality of services related to needle stick and make it more effective and efficient as believe by Shekelle et al (2006) and Jha et al (2009).

Time efficiency is another issue as the report can be submitted immediately from the same department to many concerned departments at any time or any shift duty and this opposite to what is happening now as the staff can submit the report only in the morning shift and should attend personally. This proves what Geradi (2002) has stated that this will allow the organization to analyze the data and respond to the incidents faster and in a more coordinated way.

5.3. Implications of the Project on the Clinical Practice:

As soon as the staff acknowledged that this project has been implemented for their safety, I believe they will start to report any needle stick injury via online reporting form and by this there will be increase in the number of reported needle stick injury among the staff. Conversely, being knowledgeable about the causes of needle stick injury and the environmental factors that increase the occurrence of needle stick injury by attending the educational workshops, the nurses will be more caution and I believe there will be decrease in the prevalence of needle stick injury. In addition, as believe by

Chaudhry et al (2006) and Blumenthal & Glaser (2007) that the electronic record system has the ability to improve the efficiency and effectiveness of health care providers

because the system will safe their time and effort of writing many forms and submitting them personally to the concerned department.

5.4. Personal Implications of the Project:

Being a change leader in this project is a critical issue because it needs first self-awareness before the project or environmental awareness. Preparing this proposal help me to understand my own strengths as a good time manager, and my weaknesses as I have low self -confidence. Also, became conscious about my leadership style as people-oriented leader. Additionally, I realized the importance of leadership support and employee involvement from the starting step in order to build a shared vision and getting their commitment. Furthermore, I recognize that any change is time consuming especially when it is related to the organizational culture or changing employee behavior. Moreover, ongoing assessment of any project is the core matter that guarantees its continuity.

5.5. Strengths and Weaknesses:

Being familiar about the weaknesses and strengths of a project from the earlier steps of writing the proposal is valuable. First of all, this proposed project is fighting for staff's safety which is highly correlated with patient's safety. As stated previously that there are a lot of physical, social and psychological effects for needle stick injury. Even when needle stick injury did not transmit any infectious disease, its emotional effects can be severe and permanent (Bandolier 2003). With those consequences if the staff did not report the incident he/she will not receive any compensation from the ministry. If the

staff being convinced with this idea by attending the educational workshops related to this project they will start to report their incidents.

Using HSE model (2008) is a solid base for implementing this proposal as it is basically depends on the staff involvement to gain their support. As pointed by Morton (2008) and Hamid & Cline (2013) that employee involvement and management support were highly associated with employee acceptance and support of the electronic health record system. Involvement of staff in training is another good point as it has positive impact on employee's acceptance to the electronic record system as pointed by Hamid & Cline (2013).

The time is not an issue in this project because we can take time as much as we need from starting till evaluation phase. As the proposal is requesting a period of piloting to evaluate the effectiveness of the form and then will be finalized after the staff feedback. Moreover, SWOT analysis was used earlier to present the strengths and weaknesses of application of online reporting system (refer to appendix no. 5).

On the other hand, there is no possibility to assess that all needle stick injuries are being reported because each staff from her/his work place will decide to report the incident or not. Besides, even if the computer devices are available in the department the implementation of many electronic projects will need more devices as it will be overloaded and should be used by all health team members.

5.6. Recommendations:

- Application of this project is the first recommended issue that I am looking for, but this should be applied with sufficient time that will allow the staff to understand and accept in

order to use it. As mentioned earlier, that change needs time and work especially during the implementation and conversion period (Leonard 2004). Also, long standing practices are difficult to change.

- The previous survey results displayed that the majority of the staff did not receive education and training about the safe use of needles, and the process of reporting needle stick injury, so this should be included in the orientation phase of each new staff.

- Needle stick injury post exposure follow up and related vaccines should be kept as a requirement for renewal of license.

- Although it is costly the regular needles should be replaced with devices that prevent needle stick injury such as needless IV connector or self-re-sheathing needle.

5.7. Conclusions:

This proposed project focused on the implementation of online reporting system for reporting needle stick injury in accident and emergency department. The need for this project originated from the previous survey that has been done and show high prevalence of underreporting of needle stick injury among the staff. The challenge to sustain a safe environment that would improve the staff safety is important as any other aspect of health care. Organizational systems, culture, beliefs, and values are part of that environment. The HSE model (2008) was used as a firm establishment for the proposed methodology. Engaging the stakeholders and utilizing communication as a tool in all aspects of those methodologies is the promising issue which makes this project to be perceived positively.

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Appendix 1:

Force Field Analysis (Lewin 1951)

Driving Forces	Restraining Forces
- Leadership support - Less cost - Saving time - Less effort - Hospital policies - Current process and form - Bahrain National Code of Professional Conduct for Nursing - Technology	- Increase workload (if staff being asked to report in both forms paper and on-line) - Resistance to change

Appendix 2:

مملكة البحرين
الهيئة العامة للتأمينات الإجتماعية
وزارة الصحة

KINGDOM OF BAHRAIN
General Organisation for Social Insurance
&
Ministry of Health

Occupational Trauma/Disease Report تقرير عن إصابة عمل / مرض مهني

Name ..... الاسم DATE ..... التاريخ
CPR | | | | | | | | الرقم السكاني Sex ..... الجنس NATIONALITY ..... الجنسية
العنوان ADDRESS | شقة Flat ..... بناية Bldg. ..... طريق Road ..... منطقة Area ..... مجمع Block ..... هاتف Tel.
OCCUPATION ..... الوظيفة EMPLOYER ..... جهة العمل
TELEPHONE ..... هاتف P.O. Box ..... ص . ب
EMPLOYER No. ..... رقم تأمين صاحب العمل GOSI No. ..... رقم تأمين العامل
BROUGHT BY ..... أحضر بواسطة NEXT OF KIN ..... اسم أقرب شخص

ACCIDENT CLASSIFICATION: R.T. Accident حادث طريق (Driver ☐ سائق - Passenger ☐ راكب - Pedestrian ☐ ماشي)
Work ☐ عمل - Occupational ☐ مهني - Sport ☐ رياضة - Self inflicted ☐ متعمد - Assault ☐ اعتداء - Exhaustion ☐ إرهاق - Death ☐ وفاة

Temp	
BP	
Pulse	
Resp.	
Allergies :	

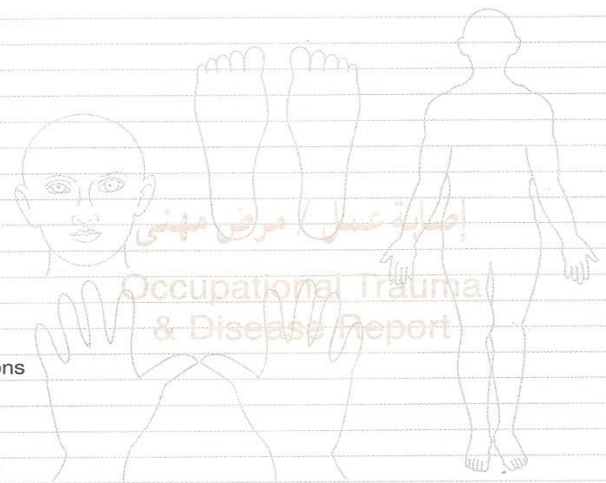
التوقيع مع الختم الرسمي لجهة العمل

Time ..... وقت الحادث Date of Incident ..... تاريخ الحادث
Details of Incident ..... تفاصيل الحادث
Cause ..... سبب الإصابة
Place ..... مكان وقوع الإصابة
Type ..... نوع الإصابة
Time of Arrival at H.C. ..... وقت الوصول للمركز Time Seen by Physician ..... وقت فحص الطبيب

History

Physical

Investigations



DIAGNOSIS

REFERRED TO
- ☐ A & E
- ☐ Surgical
- ☐ Medical
- ☐ Ortho.
- ☐ Gyn / Obs
- ☐ E.N.T.
- ☐ Eye
- ☐ Dental
- ☐ Local HC
- ☐ Others

☐ Fit for Duty ☐ Advised Rest for Days ( )

White: Treating Centre- Blue: A&E - Green: GOSI - Pink: Police - Yellow: Discharge Note - Orange: Personal File
أبيض: جهة العلاج - أزرق: قسم الطوارئ - أخضر: الهيئة العامة للتأمينات الاجتماعية - وردي: إشعار لعربة نقل - أصفر: مركز الشرطة - برتقالي: جهة العمل

ATTENDANCE REPORT بيان بتردد المصاب للعلاج

توقيع الطبيب المعالج Doctor's Signature	بيان حالة الإصابة Discharge/Impression	تاريخ مراجعة المناظرة Date of Follow up	Absence from Work From إلى	مدة التخلف عن العمل To من	تاريخ المناظرة Date of Consultation

DISCHARGE NOTE DATE

☐ Fit for Duty (Back to Work) ☐ عودة للعمل
☐ Advised Light Duty for Days ( ) ( ) يوم ☐ ينصح بعمل خفيف لمدة

Doctor's Name & Signature

Appendix 3: Page 1

KINGDOM OF BAHRAIN
Civil Service Bureau

مملكة البحرين
ديوان الخدمة المدنية

استمارة رقم (١) — **تقرير حادث/ مرض مهني**

رقم الحادث: _____ رقم التسلسل: _____ (خاص بديوان الخدمة المدنية)

الوزارة/الجهة الحكومية: _____ الإدارة/القسم: _____

تصنيف الحادثة: ○ حادث عمل بدون إصابة ○ إصابة بسيطة بدون علاج ○ إسعاف أولي (إصابة بسيطة أدت إلى تقديم إسعافات أولية في موقع الحادث)
○ إصابة جسيمة ○ وفاة ○ مرض مهني ○ رعاية صحية (إصابة بسيطة أدت إلى مراجعة الطبيب)

معلومات عن المصاب

الاسم: _____ الرقم الشخصي | | | | | | | | | |

الوظيفة: _____ النوع: ○ ذكر ○ أنثى الجنسية: _____

رقم الاتصال: _____ البريد الالكتروني: _____

تاريخ التعيين: ___/___/_____ نوع التعيين: ○ توظيف دائم ○ توظيف جزئي ○ توظيف مؤقت ○ توظيف مؤقت صيفي

غير الموظفين: ○ مقاول ○ زائر ○ متدرب (طالب)

معلومات عن الإصابة/المرض المهني

تاريخ وقوع الحادث: ___/___/_____ وقت وقوع الحادث: _____ صباحاً/مساءً

موقع الحادث: _____ العنوان: _____

_____ _____

الإجراءات الأولية: ○ لا توجد ○ إسعاف أولي ○ نقل المصاب إلى المستشفى ○ ترك العمل والذهاب للمنزل ○ الرجوع إلى العمل
○ وقف العمل ○ أخرى: _____

وصف الحادث (يتم شرح كيفية وقوع الحادث من حيث العمل الجاري ودور المصاب ووسائل العمل والظروف البيئية، يمكن إرفاق معلومات إضافية)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

استمارة رقم (١) – تعليمات الخدمة المدنية رقم (٥) لسنة ٢٠٠٩ ٣/١

Appendix 3: Page 2

KINGDOM OF BAHRAIN
Civil Service Bureau

مملكة البحرين
ديوان الخدمة المدنية

نوع الحادث

○ تعثر، سقوط أو انزلاق في نفس المستوى	○ انحشار جزء من الجسم	○ عدوى ناتجة عن عناصر بيولوجية	○ اختناق
○ سقوط من ارتفاع (مترين أو أقل)	○ التعرض إلى الحرارة	○ الإجهاد أو الإرهاق	○ غرق
○ سقوط من ارتفاع (أكثر من مترين)	○ التعرض إلى الضجيج	○ جهد مفرط أو حركة عنيفة	○ انهيار
○ سقوط مواد أو أجسام	○ التعرض إلى الاهتزازات	○ مناولة، رفع ، نقل المواد أو الأغراض	○ انفجار
○ اصطدام بأجسام ثابتة أو متحركة	○ التعرض لمواد سامة	○ ضربة خفيفة بجسم أو مادة	○ حريق
○ اصطدام بمركبة	○ التعرض لمواد كيميائية	○ عضة أو لسعة حيوان / حشرة	○ اعتداء
○ تطاير مواد أو أجسام	○ التعرض لمواد مشعة	○ ملامسة حيوانات مريضة	○ ضربة شمس
○ الانحصار ضمن الأشياء أو تحتها أو بينها	○ التعرض لتيار كهربائي	○ وخز إبر / مواد حادة ملوثة	○ حوادث الطرق

○ أخرى: _____

المادة / الوسيلة المسببة للحادث (تحديد ما إذا كان الحادث ناجم عن ماكينة أو تجهيزات أو معدات تستخدم في العمل أو مواد ضارة أو عوامل فيزيائية أو ظروف بيئية)

_____

_____

نوع الإصابة

○ كسر	○ كدمة	○ إغماء
○ خلع	○ صدمة	○ ألم
○ رضوض	○ توتر	○ إحمرار وحرقة
○ جرح	○ إصابات سطحية	○ تسمم
○ بتر	○ سكتة دماغية	○ حروق
○ إزاحة	○ سكتة قلبية	○ فقدان السمع
○ شد أو التواء	○ نزيف دموي	○ فقدان البصر
○ تمزق	○ وخز أو خدش	○ اصابات متعددة

○ مرض مهني : _____

_____

○ أخرى: _____

موضع الإصابة

	اليمن	اليسار		اليمن	اليسار
○ الرأس	○		○ العين	○	○
○ الوجه	○		○ الأذن	○	○
○ الأنف	○		○ الكتف	○	○
○ الأسنان	○		○ الذراع	○	○
○ الرقبة	○		○ اليد	○	○
○ الصدر	○		○ أصابع اليد	○	○
○ الظهر	○		○ الرجل	○	○
○ البطن	○		○ الركبة	○	○
○ الحوض	○		○ القدم	○	○
○ أماكن متفرقة	○		○ أصابع القدم	○	○

○ أخرى : _____

الحالة الصحية للمصاب

التاريخ: ___/___/_____ حالة المصاب: ○مستقرة ○ خطرة تحتاج لمتابعة العلاج ○غير معروف (لا يمكن الاتصال به)

مدة الانقطاع عن العمل من : التاريخ ___/___/_____ الوقت ___:___ إلى : التاريخ ___/___/_____ الوقت ___:___

Appendix 3: Page 3

KINGDOM OF BAHRAIN
Civil Service Bureau

مملكة البحرين
ديوان الخدمة المدنية

العوامل المشاركة في وقوع الإصابة (هذا الجزء يملء من قبل الإدارة)

- ○ اتباع طريقة غير آمنة
- ○ افتقار المصاب إلى التدريب المناسب (عدم الوعي بالمخاطر)
- ○ عيوب في الترتيب والتنظيم لأمكنة وأدوات العمل
- ○ الإشراف دون المستوى المطلوب
- ○ عيوب في التصميم
- ○ ظروف بيئية (نقص الإنارة في أماكن العمل، التهوية، الضوضاء، الاهتزازات)
- ○ نقص في الصيانة
- ○ عدم استخدام معدات الوقاية الشخصية
- ○ فشل في مكونات التشغيل أو التحكم
- ○ مخالفة التعليمات، المزاح، الإندفاع (الحماس) في أداء العمل المطلوب
- ○ أخرى (برجاء التحديد)

إجراءات التحسين والمتابعة (هذا الجزء يملء من قبل الإدارة)

الإجراءات المنجزة	الإجراءات قيد المتابعة	تاريخ التنفيذ

معلومات أخرى

اعتماد التقرير

المشرف المباشر	المدير المسئول	منسق السلامة
الاسم :	الاسم :	الاسم :
التوقيع :	التوقيع :	التوقيع :
التاريخ : / /	التاريخ : / /	التاريخ : / /
رقم الاتصال:	رقم الاتصال:	رقم الاتصال:

الإرشادات: ١- يعتمد التقرير ويرسل لديوان الخدمة المدنية. ٢- ترفق التقارير الطبية وإفادة الشهود إن وجدت.

استمارة رقم (١) - تعليمات الخدمة المدنية رقم (٥) لسنة ٢٠٠٩ ٣/٣

Appendix 4:

External Environmental Analysis

PESTLE Framework

Political	Technological
- This project proposed to meet the national and hospital policies of improving the quality and safety of health care services.	- Staff is trained to report through online system. - Computer devices already available in the department.
Economic	**Legal**
- No budget is needed to upload the form in intranet system of the hospital.	- This project will be implemented after getting the approval from Research Technical Support Team, Hospital Administration, and Nursing Administration.
Social	**Environmental**
- Implementing this project will decrease the social interaction with the personnel of Infection Control Unit and Occupational Health Unit.	- This project will save the green life and environment from the paper wastage.

Appendix 5:

Internal Environmental Analysis

SOWT Analysis

Strengths	Weaknesses
-Leadership support **-** Saving time - Saving effort - Saving money (cost effective) - Availability of the computer devices - Staff skills	- No possibility to assess that all needle stick injuries are being reported
Opportunities	**Threats**
- Getting the accurate statistics about prevalence of reporting - Developing of educational and training program for the staff - Replacing the existed type of needles with safer needle device (e.g. self-re-sheathing needle)	- Resistance to change - The agreement of Infection Control Unit to interfere in their duty as they are responsible about the incidents reporting system in the hospital - No change in the number of reported incidents

Appendix 6:

Gantt Chart

Project Steps / Phases	Jan.	Feb.	March.	April.	May.	June.	July	August	Sep.
Submitting the proposal for review by Research Technical support team.									
Getting the approval from Hospital Administration, Nursing Administration,									
Arranging the meeting with educational committee and quality committee in the department									
Arranging a departmental meeting with all staff and the head nurse to announce about the project									
Arranging for the workshop and educational presentation									
Piloting the proposed form									
Finalizing the form with the concerned departments									

Workshop to inform the staff about changes in the form									
Uploading the finalized form and starting the implementation									

Appendix 7: Page 1 Needle-stick Injury Report form

Instructions: This form is to be used to report needle-stick or sharp injuries by personnel in Ministry of Health.

A. Employee Information:

Name

CPR No

Nationality

Address: Flat Bldg Road Area Block

Occupation Telephone

B. Employer Information:

Employer Hospital Name

Department/ Ward Telephone

C. Injury Information:

Place of injury Date Time

Type of sharp

☐ IV cannula ☐ vacuum tube collection ☐ Blood gas syringe ☐ Insulin syringe ☐ Suture needle

☐ Winged steel needle ☐ lancet ☐ scalpel ☐ staples ☐ Ampule ☐ blood tube ☐ wire

☐ Other syringe with needle ☐ Other, specify

Intended use of sharp

☐ Draw arterial sample ☐ Draw venous sample ☐ IM injection ☐ SC injection ☐ ID injection

☐ Start IV ☐ Obtain body fluid/tissue sample ☐ Suturing ☐ Wiring ☐ Drilling

☐ Other, specify

When did injury occur ☐ Before ☐ During ☐ After, the sharp used for its intended purpose.

If the exposure occurred during or after the sharp was used, was it:

☐ During recapping ☐ During placing it in a container ☐ While passing the instrument

☐ While disassembling the instrument ☐ Because of patient's sudden movement

☐ Other, specify

Involved body part: ☐ hand ☐ arm ☐ face ☐ head ☐ neck ☐ chest ☐ abdomen ☐ back

☐ leg ☐ foot

During injury, were you wearing gloves ☐ Yes ☐ No

Have you finished Hepatitis B vaccination series? ☐ Yea ☐ No

Appendix 7: Page 2

Date of Reporting:

Submit

Appendix 8:

FOCUSPDSA Cycle

Step	Explanation
F: *Find*	- The existed reporting system of NSI that lead to underreporting.
O: *Organize*	- The steering team is the quality committee members headed by the head nurse. - The second team is consists from the staff who accepted to be as volunteers.
C: *Clarity*	- The current process of reporting NSI, where the staff has to fill two forms, then to attend the Infection Control Unit, and Occupational Health Unit. - The form is hand writing and the staff has to write the full story of the incident.
U: *Understand*	- The causes of underreporting were clarified through the initial assessment .
S: *Select*	- Replace the existed hand writing form with online reporting form.
P: *Plan*	- The action plan is outlined in the Gantt chart.
D: *DO*	- On-line form will be piloted for three months. - Workshop will be organized.
S: *Study*	- Questionnaire and interview will be done to assess the strengths and weaknesses.

A: *Act*	- According to the results of this piloting phase, the online reporting system will be continued, modified or changed.

Appendix 9: Proposed Questionnaire

1- Name (optional): ----------

2- Job Title: ----------

3- Nationality:

☐ Bahraini ☐ Indian ☐ Philippine ☐ Egyptian

4- Years of Experience:

☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ more than 15

5- Gender ☐ Male ☐ Female

6- Did you sustain a needle-stick injury in the past years?

☐ Yes ☐ No

7- Did you report the incident?

☐ Yes ☐ No

7- From your point of view, what are the causes of not reporting needle stick injury?

☐ The process of reporting is time consuming.

☐ The process of reporting required a lot of paperwork.

☐ The process of reporting is complicated.

☐ Not familiar with the process of reporting needle-stick incident.

☐ Dissatisfaction with post exposure testing and treatment steps.

☐ Fear from the future results of the report.

☐ No benefits from reporting needle-stick incidents.

☐ Others, specify ----------

8- Are you aware of the process to follow if you sustain a needle-stick injury?

☐ Yes ☐ No

9- Have you received training or education on the process to follow if you sustain a needle-stick injury?

☐ Yes ☐ No

10- In the future, if you sustain any needle-stick injury would you report it?

☐ Yes ☐ No

11- Will you report through the online reporting system?

☐ Yes ☐ No

12- Do you think there is a relationship between shift duty and occurrence of needle stick injury?

☐ Yes ☐ No

13- Do you think there is a relationship between workload and occurrence of needle stick injury?

☐ Yes ☐ No

14- Do you think there is a relationship between staff shortage and occurrence of needle stick injury?

☐ Yes ☐ No

15- Rate the following activities from highest to lowest activities that causes needle stick injury:

- ☐ Needle recapping
- ☐ Suturing
- ☐ Draw arterial sample
- ☐ Draw venous sample
- ☐ Start IV
- ☐ IM injection
- ☐ SC injection
- ☐ ID injection
- ☐ Obtain body fluid/tissue sample
- ☐ Other, specify ----------

Appendix 10: Page 1

Ohio | Bureau of Workers' Compensation

Public Employment Risk Reduction Program
State of Ohio
Division of Safety and Hygiene
13430 Yarmouth Drive
Pickerington, Ohio 43147
614-644-2246 or 800-671-6858
Fax: 614-644-3133

Sharps Injury Form
Needlestick Report

Instructions: This form is to be used to report needlestick or sharps injuries by personnel in your organization responsible for reporting such incidents to the Public Employment Risk Reduction Program. It is preferred that the public employer submit all forms via the Internet.

Public employer information

1) Employer: _____ **2) Facility:** _____ **Risk #:** _____

3) Address: _____

4) City: _____ **5) State:** OH **6) ZIP code:** _____ **7) County:** _____

Address of reporter if different from facility where injury occurred (no P.O. boxes): _____

8) Date reported: _____ **By:** _____ **Phone:** _____

Injury information

9) Date of injury: _____ **10) Time of injury:** _____ **11) Age of injured:** _____ **12) Sex of injured:** ☐ **Male** ☐ **Female**

13) Type of Sharp: Needle

☐ Blood gas syringe ☐ Insulin syringe with needle ☐ IV catheter- loose ☐ Needle connected to IV line
☐ Needle factory-attached to syringe ☐ Other nonsuture needle ☐ Other syringe with needle
☐ Prefilled cartridge syringe (i.e. Tubex-type) ☐ Syringe- other ☐ Tuberculin syringe with needle ☐ Vacuum tube collection
☐ Winged steel needle

Surgical instrument (non glass)

☐ Lancet ☐ Other non-glass sharp ☐ Scalpel ☐ Staples ☐ Suture needle ☐ Trocar ☐ Wire

Glass

☐ Ampule ☐ Blood tube ☐ Other glass ☐ Other tube ☐ Slide

14) Brand (write brand name or "unknown"): _____ **15) Model number:** _____

16) Job classification of injured person: ☐ Aide (e.g. CNA/HHA) ☐ Chiropractor ☐ CRNA/NP ☐ EMT/paramedic ☐ Firefighter
☐ Housekeeper/laundry ☐ LPN ☐ Maintenance ☐ MD/DO ☐ Other ☐ PA ☐ Phlebotomist/lab tech
☐ Respiratory therapist ☐ RN ☐ Road crew ☐ School personnel (not nurse) ☐ Sewer & Sanitation ☐ Surgery assistant/OR tech

17) Employment status of injured person: ☐ Contractor/contract employee ☐ Employee ☐ Other ☐ Student ☐ Volunteer

18) Type of location/facility/agency where sharps injury occurred: ☐ Bloodbank/center/mobile ☐ Clinic ☐ Correctional facility ☐ EMS/fire/police
☐ Home health ☐ Hospital ☐ Laboratory (freestanding) ☐ Other ☐ Outpatient treatment (e.g. dialysis -infusion therapy)
☐ Radiology ☐ Residential facility (e.g. MHMR-shelter) ☐ School

19) Work area where sharps injury occurred (select best choice): ☐ Autopsy/pathology ☐ Blood bank/center/mobile ☐ Central sterile
☐ Critical care unit ☐ Dialysis room/center ☐ Emergency dept. ☐ EMS/fire response ☐ Field (non EMS)
☐ Floor - not patient room ☐ Home ☐ Infirmary ☐ Laboratory ☐ L&D ☐ Medical/outpatient clinic ☐ OR
☐ Patient/resident room ☐ Pre-op or PACU ☐ Procedure room ☐ Radiology ☐ Roadside park ☐ Seclusion room
☐ Service/utility area (e.g. laundry) ☐ Sewage treatment facility ☐ Other

20) Original intended use of sharp: ☐ Contain specimen/pharmaceutical ☐ Cutting (surgery) ☐ Draw arterial sample ☐ Draw venous sample
☐ Drilling ☐ Electrocautery ☐ Finger stick/heel stick ☐ Heparin or saline flush ☐ Injection - IM ☐ Injection - SC/ID
☐ Obtain body fluid/tissue sample ☐ Other injection/aspiration IV ☐ Start IV or set up heparin lock ☐ Suturing - deep
☐ Suturing - skin ☐ Unknown/NA ☐ Wiring ☐ Other

Appendix 10: Page 2

Injury information - continued

21) When did injury occur? ☐ Before ☐ After ☐ During **...the sharp was used for its intended purpose.**

22) If the exposure occurred "during" or "after" the sharp was used, was it: ☐ Because the injured was bumped during the procedure

☐ Because the item was placed in an inappropriate place (e.g. table/bed/trash)

☐ During OR procedure reaching for or passing instrument ☐ While disassembling

☐ While the sharp was being placed in a container ☐ While recapping ☐ Other

23) Involved body part: ☐ Arm (but not hand) ☐ Face/head/neck ☐ Hand ☐ Leg/foot ☐ Torso (front or back)

24) Did the device being used have any engineered sharps injury protection? ☐ Yes ☐ No ☐ Don't Know

25) Was the protective mechanism activated? ☐ Yes ☐ No ☐ Don't Know

26) Was the injured person wearing gloves? ☐ Yes ☐ No ☐ Don't Know

27) Had the injured person completed a hepatitis B vaccination series? ☐ Yes ☐ No ☐ Don't Know

28) Was there a sharps container readily available for disposal of the sharp? ☐ Yes ☐ No ☐ Don't Know

29) Had the injured person received training on the exposure control plan in the 12 months prior to the incident? ☐ Yes ☐ No ☐ Don't Know

30) Exposed employee: If sharp had no engineered sharps injury protection, do you have an opinion that such a mechanism could have prevented the injury?

☐ Yes ☐ No

Explain: _____

_____

_____

31) Exposed employee: Do you have an opinion that any other engineering, administrative, or workpractice control could have prevented the injury?

☐ Yes ☐ No

Explain: _____

_____

_____

Ohio | **Bureau of Workers' Compensation**

Public Employment Risk Reduction Program
State of Ohio
Division of Safety and Hygiene
13430 Yarmouth Drive
Pickerington, Ohio 43147
614-644-2246 or 800-671-6858
Fax: 614-644-3133

Appendix 11: Kirkpatrick's evaluation model

Evaluation Level	Evaluation Description and Characteristics	Evaluation methods	relevance and practicability
1. Reaction	- Personal reactions to the project, for example: Did the staff like and enjoy the training? Did they consider the training relevant? Was it a good use of their time? Did they like the venue, the style, timing, domestics, etc? Level of participation. Ease and comfort of experience. Level of effort required to make the most of the learning. Perceived practicability and potential for applying the learning.	- Questionnaire.	- will be done after one year from the implementation.
2. Learning	- Measurement of the increase in knowledge or intellectual capability from before to after the learning experience: Did the staff learn what intended to be taught? Did the staff experience what was intended for them to experience?	- Questionnaire. - Interview	- will be done after one year from the implementation.
3. Behavior	- Measurement of the behavioral tendencies toward implementation. Did the staff put their learning into effect when back on the job? Were the relevant skills and knowledge used? Was there noticeable and measurable change in the activity and performance of the staff when	- Questionnaire. - Interview	- will be done after one year from the implementation.

	back in their roles? Was the change in behavior and new level of knowledge sustained? Would the staff be able to transfer their learning to another person? Is the staff aware of their change in behavior, knowledge, skill level?		
4. Results	- Evaluation the effects of the project. - No. of reported needle stick incidents. - No. of Nurses following post exposure follow up.	- Questionnaire. - Interview	- will be done after one year from the implementation.

Adapted from Kirkpatrick's learning and training evaluation theory